



Oct 8 2009
11:23AM

EXHIBIT 12

ZIGH } FYI. TMM
THH } VMD JST
8-30-84 TOX
August 23, 1984

FYI. VMD 8-24-84

TO: V. M. Dugan
FROM: B. J. Mickelson
SUBJECT: MTBE Contamination of Ground Water

RECEIVED		
AUG 24 1984		
MARKETING PLANNING		

RECEIVED		
J. G. HARDY		
SEP 1 1984		
REC'D	FILED	SEE ALSO
ESN		
SLB		
DRG		
NRB		
RDP		
JMU		
KBS		
CWN		
Rebator		

The following is in response to your August 8, 1984, memo to Mr. S. D. Curran requesting information on additional potential ground water contamination problems that are associated with the use of MTBE in gasoline.

First MTBE, when dissolved in ground water, will migrate farther than BTX before soil attenuation processes stop the MTBE migration.

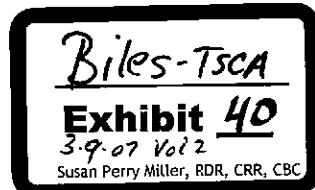
For example, a town well in Thurmont, Maryland was contaminated by IPE, a similar ether compound, even though the soluble BTX plume migration was such that the well was not contaminated by these components. Well replacement costs are expected to exceed \$500k in this case.

Another example is at Jacksonville, Maryland where the leading edge of the Gulf MTBE plume has not been controlled and migrated over twice the distance of the Exxon BTX plume migration, which has been halted. We are now facing onerous Federal EPA compliance actions which will add costs to this multimillion dollar incident.

Second, MTBE has lower odor and taste thresholds than BTX. Therefore low, non-hazardous, analytically non-detectable levels of MTBE continue to be a source of odor and taste complaints in affected drinking water. This low threshold will extend the clean up and testing time to close out a well contamination incident.

Third, MTBE cannot be removed by carbon adsorption. Small household carbon filtration units are used by Exxon to treat private drinking supplies contaminated by BTX. This option would not provide adequate treatment for water supplies additionally contaminated by MTBE. Air stripping or a combination of air stripping and carbon adsorption would be required to clean up water contaminated by BTX and MTBE. Attachment A compares initial and operating costs associated with various treatment options.

In summary, there appear to be three reasons MTBE could add to ground water incident costs and adverse public exposure.



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Would exposure be less if limit introduction to Tepex P/L only?
New stations, less distributor
Serial, controlled furnishing ??
New Tank lines for RAS that would handle
MTBE? -PPL
With 62 ground
water clean up activities underway at an average annual cost of \$3M, this
represents an increase of some 120 or \$6M to a total of 180 and \$9M ^{how many}
^{link to}
annual cost. ^{BPL/SAPL}

Based on higher mobility and taste/odor characteristics of MTBE, Exxon's ^{handle}
experiences with contaminations in Maryland and our knowledge of Shell's ^{handle}
experience with MTBE contamination incidents, the number of well
contamination incidents is estimated to increase three times following
the widespread introduction of MTBE into Exxon gasoline. With 62 ground
water clean up activities underway at an average annual cost of \$3M, this
represents an increase of some 120 or \$6M to a total of 180 and \$9M ^{how many}
annual cost. ^{link to}
^{BPL/SAPL}

Finally, the closing-out of these incidents would take longer and
treatment costs would be higher by a factor of 5 (Attachment A).
Therefore, we estimate that by extending close-out times the 180
incidents would double to over 300. Shell Oil currently has over 300
ongoing contamination incidents which resulted at some 4,000 retail
facilities, versus 62 incidents at Exxon's 7,000 retail facilities. The
estimated additional costs involved would result in annual leaker
incident costs exceeding \$20M.

? → 20
(includes item?)

There is a fourth, and probably the most significant, consideration. Any
increase in potential ground water contamination will also increase risk
exposure to major incidents. Since 1978, Exxon has been exposed to three
major ground water incidents (East Meadow, L.I.; Canob Park, R.I.;
Jacksonville, MD). While the most recent cases are unsettled, the cost
of these incidents can be as high as \$7M each based on East Meadow.
Therefore, if the trend of one \$7M suit every two years is increased
commensurate with the number of ongoing outstanding incidents (i.e.,
current 62 to over 300) then annual major incident costs would increase
from \$3.5M to some \$18M.

3.5 - 7 (3)

5 → 36
(+?) ^(+?)
Assume 7,000 retail outlets
Total U.S.

Taking the above four factors into consideration, it would appear that
widespread use of MTBE has the potential of increasing our ongoing
contamination incidents from a current of 62 to over 300 and costs from
\$6.5M (\$3M and \$3.5M) to over \$40M (\$20M and \$18M).

Please call me if you have any questions regarding the concerns outlined
above.

BJM:jm

c - S. D. Curran
J. S. Dick
R. R. Eaton

*0499g

Barbara J. Nickelson

$$\$40M - \$6.5M = \$33.5M/YR$$

∴ 2700KB/YR MTBE USE MUST CARRY ADDED

$$\text{DEBIT OF } \frac{33,500 \text{ KB}}{700 \text{ KB}} = 47,86 \text{ $/B} = \underline{\underline{\text{$1.14/B of MTBE}}}$$

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